THE TEXTILE WORLD RECORD
KINK BOOKS

No. 10

Kinks for Knitters
No. 2

Compiled from the
QUESTIONS AND ANSWERS DEPARTMENT
of the
TEXTILE WORLD RECORD

PRICE 75 CENTS

LORD & NAGLE COMPANY
Publishers
Boston, Mass., U. S. A.

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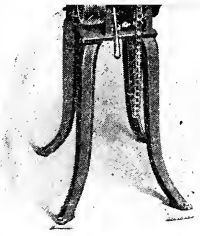

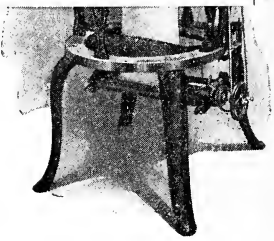

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UNIVERSAL WINDING COMPANY
BOSTON

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No. 10.

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From the
QUESTIONS AND ANSWERS DEPARTMENT
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COMPILED AND EDITED BY
CLARENCE HUTTON

LORD & NAGLE COMPANY
Publishers
Boston, Mass., U. S. A.

PREFACE

The success which attended the publication of Kinks for Knitters, the first of the Textile World Record kink books, a large edition having been exhausted within a few months, has led us to compile this book of practical experiences in knit goods manufacturing.

The editors of the Textile World Record are at all times face to face with the problem of securing practical information. For years its subscribers have been invited to make free use of its columns in asking questions relating to textile manufacturing, and it occurred to us that if some of the most important and most interesting of the practical questions that have been answered were gathered together in a handy form for quick reference it would meet a widespread want.

This book contains information which has been supplied by manufacturers, superintendents and overseers from their private record books and their stores of knowledge gained by experience. Many questions are answered and much information given, but subscribers should remember that if there is any information they desire which is not given in this volume, it is their privilege to ask the Questions and Answers Department of the Textile

World Record and every effort will be made to publish the information they want, provided the question is one of general interest to the trade.

No effort has been made to group the questions and answers relating to the different operations in knit goods manufacturing in any part of the book. The index has been carefully prepared, however, and its use should enable anyone to secure the information he seeks in the shortest possible time.

Grateful acknowledgment is due to the men who have supplied the information, and if Kinks for Knitters No. 2 should benefit any of the large number of men for whom it is intended, both they and the publishers will feel that its mission has been accomplished.

TEXTILE WORLD RECORD,
Lord & Nagle Company,
Publishers.

Kinks for Knitters No. 2.

"Air Stains" on Bleached Goods

Enclosed find sample of bleached knit goods with yellow streaks. Could you inform us the cause of these yellow marks, which have given us considerable trouble during the hot weather? In our bleaching process we boil out with caustic soda and bleaching assistant and use chloride lime in bleaching and sour with oil or vitriol. We then soap with chip soap, but the yellow marks will appear whether we use soap or not. We dry and roll the goods on what is called the Murphy dryer, putting the goods on wool covered pipes damp and blowing hot air through the pipes, drying the goods while they are rolled up.

Wayburn (1206).

The stains on the sample of knit goods are what are called "air stains." These stains appear more often in hot weather than in cold. If the goods are left in a damp condition in a hot room, or when they are exposed to hot air and left in a pile, the streaks will often appear. If the goods are dryed up every night no difficulty will be experienced.

The system of drying that "Wayburn" explains is a very good one and I feel confident that the streaks are not caused by this process. If there are any goods lying in the wet

state during the night or week ends, examine them carefully next morning and you will notice the yellow streaks around the overhanging laps. These can be taken out by pouring boiling water on them through a fine spray or garden hose. If this method does no good or if the stains are heavy the goods will have to be given a sour bath.

I have had this same trouble in hot weather and find that by covering all the wet goods that have to lie over night with wet cloths the trouble is removed. If we have any goods lying in the white piles we cover them with sheets and give them a good bath with the hose three or four times each day. Delco.

Broken Needles

We enclose sample of a 36-gauge standard B needle. We are having a lot of them broken off at the heads like sample. I am also sending a sample of a stocking. You will notice that it is broken between the gore. There is a place on the machine where the yarn guide never touches the needles, as they do not go in or out. Can you give me some information as to what breaks the needles? We are using a 79 standard B machine. Weston (1228).

There are a great many things which may cause the breaking of needles and for this reason it is a very difficult matter to give the exact cause of the trouble in "Weston's" case

without having a chance to see the machine in operation. However, I will state the principal faults which usually are the cause of needle breakage, and by acting upon each of these suggestions separately "Weston" should be able to locate the trouble.

The principal cause of needles breaking off at the hook or cheek is running the machine at too high a rate of speed. A 79 standard B machine should not be run at more than 290 revolutions per minute.

Another cause for breakage is the stitch cams being worn off round at the corners. The main stitch cams should be kept well smoothed up, and when worn off at the corners should either be replaced with new ones or the corners drawn out and squared up. From the appearance of the sample sent me I would say that this was the cause of the trouble. When the stitch cams become worn it is impossible to get a uniform stitch or tension, which results in the fabric having an uneven stitch, one course being tight and the next one loose. This is especially true if the belts are not kept well tightened and a uniform speed maintained.

Using yarn that is too fine for the machine might also cause breakage of the needles. The use of such yarn necessitates the tightening of the stitch to such an extent as to put

too much strain on the hooks of the needles. This always results if the machine is run at too high a rate of speed. The fault can be remedied by using a needle with a smaller hook or by reducing the speed, without affecting the weight of the goods.

Another cause for breakage may be not cleaning the head of the machine as often as it should be. Again the yarn guide or latch ring sometimes becomes worn rough and will break the needles. However, in this case the latch is usually broken off instead of the hook.

Too much care cannot be taken to keep the stitch cams and filling-in cams well smoothed up and the worn cams replaced with new ones so the needles will pass smoothly through the needle trough or path of the cam cylinder, thus preventing the needles from being subject to quick and unnecessary jars or strain. Merrill.

Seconds and Waste on Underwear

Please advise us what is the average percentage of seconds and waste on ladies' cotton ribbed underwear for a 6 1/2 lb. carded yarn garment, an 8 lb. combed yarn garment, and a 1/4 lb. Richelieu and 2 by 2 straight cloth.
Salem (1068).

I have no exact data as to the percentage of

seconds on ladies' underwear, but the average percentage of seconds will run from 3 to 7 per cent. If the mill does not exceed 3 per cent. of seconds on any of these lines it is doing very well. On the other hand if the percentage of seconds exceed 7 per cent. the mill is likely to be manufacturing at a loss, as owing to the very close competition in all classes of knit underwear, either men's or ladies', the margin of profit is figured so very close that it would be entirely wiped out by the loss on seconds should they exceed 7 per cent. Most manufacturers figure on about 5 per cent. of seconds. Lafayette.

Waste on Ribbed Hosiery

Please let me know what amount of waste is figured per dozen of fine gauge ribbed hosiery, made of 18s carded peeler yarn. The ribbers are running without stop motions. Also how many needles are generally used per day on the same stockings. Orleans (1112).

The amount of waste will depend very largely upon conditions. For example, some manufacturers run the yarn direct from the cone, while others backwind all their cones. In order to keep the waste down to the lowest possible amount, the yarn should be rewound, and the best grade of mule spun yarn used. If the machines are in good repair and

operated by experienced operators, the waste from the ribbers should not run over two ounces to the dozen, while the waste from the transfer machines will run about the same. The menders in this class of work will average about ten per cent.

The needle breakage on the ribbers should not be over one needle to every five dozen of ribbed tops. The needle breakage on the transfer machines should not be over one needle to four ounces of work. However, in mills buying their yarns in small quantities and from different companies the waste and menders are likely to be more than this. In our mill we are making this grade of work and are running the yarn direct from the cones, and by actual test of thirty days' run on twenty-four machines, we find our waste averages four ounces per dozen, while the menders average about ten per cent. On our transfer machines our waste, including ravelings, averages two ounces per day, while the loopers' waste amounts to one ounce per dozen. This makes the total waste on this class of goods seven ounces per dozen, and our menders ten per cent. or about three ounces per dozen.

We have also found that the greater portion of the waste from the ribbers is caused by poor winding. This will cause numerous press-offs and bad needles. We have been

able to greatly reduce the waste by back winding our yarn, which we do whenever possible. Where the yarn is rewound the use of stop motions is unnecessary, but in mills not having the capacity to rewind the yarn, I would advise the use of stop-motions as one of the best ways of reducing the waste. They reduce the number of press-offs, and preserve the needles, which are the two principal causes of waste from ribbers. Merrill.

. . .

The amount of waste on rib frames using 18s carded peeler yarn will vary considerably where stop motions are not used. In some cases the waste will average as high as five per cent. and as low as two per cent., but this is mostly the fault of the yarn. We are running our ribbers with stop motions, one boy running twenty machines, and the waste for the last six months averaged ten ounces per hundred dozen. We use 16s carded yarn.

The number of needles used on the same machines should not be more than three for each machine. If the machines are kept oiled and clean three needles will be sufficient. Oiling and cleaning have a great deal to do with broken needles. The ribbers should be cleaned every two weeks. By cleaning I mean the cam cylinder and needle slots. It would be economy in the end if "Orleans" put stop mo-

tions on his ribbers, if he has ten or more, as they will pay for themselves in less than a year. Ravenswood.

Stiff Latches

We are manufacturing mufflers and have a lot of needles with stiff latches caused by lint getting in. Kindly inform us how to get the lint out. Is there a solution that we can use? Manufacturer (1194).

I have never had any trouble of this kind except with yarn that had previously been run through some gummy solution before being delivered to the needles, either at the winder or knitter. I have examined the sample needles and find the lint the same as when the yarn has been treated with lard or other oil solutions. If "Manufacturer" will use dry paraffine, instead of the solution he is using, the trouble will be remedied. I usually melt the paraffine and mold it in large discs, putting one disc on top of the other and running the yarn between the two, which are so arranged as to revolve as the yarn passes between them. By doing this the discs will wear down evenly and can be used much longer and with a more even tention than if the yarn were simply run over a cake of paraffine. In the latter case the yarn cuts into the paraffine necessitating frequent remolding. The latter

method, however, is the simplest for experimental purposes and will give nearly the same result. Madison.

Variation in Size of Yarn

Please advise me what variation from correct weight ought reasonably to be allowed from day to day on undyed, ring spun hosiery yarn, say No. 10. Bradford (992).

This question, although apparently simple, is in fact involved in many difficulties and it is impossible to give a general answer that will apply to all cases. The wide variations in the humidity of the atmosphere in different parts of the country causes unavoidable variations in the yarn. The variations for one mill might be kept in fairly uniform limits, but these could not be accepted for any other mill in a different district. Dorset.

. . .

It would be a difficult matter to draw a hard and fast line as to the variation to be allowed on No. 10 ring spun yarn, from day to day, as there are so many minor details to be taken into consideration, circumstances being different in every mill.

The man who has care of the spinning department, to be successful in keeping his yarn the correct number, should not follow any set rule in arriving at the proper weight to spin

his yarn, but must use his own judgment, based on the condition of his spinning rooms. I have known cases where two rooms in a spinning mill have had frames spinning the same numbers, from exactly the same hank roving, on precisely the same make of machine, yet the same gears would not produce exactly the same numbers of yarn; the variation being caused by the difference in temperature and humidity of the respective rooms. This is undoubtedly the most important matter to be considered in arriving at the correct weight to keep the yarn in the spinning rooms from day to day.

The humidity will vary in sympathy with the outside atmosphere, and on damp days our friend will need to spin his yarn lighter to the extent of as much as five per cent., or it will run too coarse.

Yarn will usually run heavier in the morning, when the machinery and rooms are cool, than in the afternoon when everything has got warmed up. Consequently it is requisite to make the yarn half a tooth heavier in the second portion of the day, in order to keep the day's production as near the correct numbers as possible.

To obviate this variation and prevent the necessity of making so many alterations in the gears, the writer adopted the system of hav-

ing the spinning room floors sprinkled with water at intervals during the afternoon, which increases the humidity of the rooms and tends to keep the yarn throughout the day as near the correct number as possible, and also to improve the working of the yarn to an appreciable extent. The better and more up to date plan is to install humidifiers, by which means you can increase or decrease the humidity of the rooms as may seem desirable.

Humidifiers are certainly a great assistance in attaining regularity in the yarn in the spinning room, though if they could by any means be fixed underneath the frames instead of over the top, which would allow the moisture to ascend through the roving and yarn, instead of descending on them, the result derived would be more satisfactory.

It is also necessary for the spinning overseer to know whether the product is to be dampened after leaving the spinning rooms, and if so, to what extent, as he will have to spin his yarn lighter to compensate for the amount of moisture to be added. Even if the yarn is not to be conditioned, but is to be kept in a cool place for several days before being used, it will gain considerably in weight on coarse numbers, which gain will have to be allowed for in spinning the yarn, or the yarn will be too heavy.

Another point to be remembered is that soft spun yarn will absorb moisture quicker and to a greater extent than hard spun yarn, so that it requires practical experience to enable the overseer to keep the yarn the correct number.

On very hot, dry days the yarn will require to be spun heavier than on humid days, or it will run too light, and not only be the wrong weight, but will spin badly, be a source of loss to the employer through decrease in production, deterioration in the quality of the yarn, also extra amount of waste, and cause trouble and dissatisfaction to the employes by keeping them busy piecing up the broken threads. It behooves the man in charge to carefully watch these matters.

Testing the yarn from each spinning frame every morning and afternoon will show how it is running. It can then be made heavier or lighter as required. I should advise weighing the roving to see that it is kept on regular weight, because if it is coming irregular it may cause numerous changes in the spinning frames, which could and should be avoided.

Provided the roving is manipulated right, the spinning overseer should not have any serious difficulty in keeping his production the correct weight. By closely watching the sev-

eral details heretofore enumerated, he will gain practical experience that brings success.

Denbigh.

. . .

In order to get a satisfactory reply to this question the writer has been weighing and breaking yarns for twenty days. We have in our mill yarns from 3s to 95s, but the yarn I have been watching has been 21s. I have found that the yarn has varied only half a number. I do not know why the correspondent should say "undyed" yarn unless he wishes to know what count he should spin to have the yarn come out a 10s yarn after it has been dyed. If this is the reason, he should spin as near to a 9 1/2 yarn as possible and then he will find that he will have a variation of about half a number. A great deal depends on how well the roving has been prepared for the yarn. Good, even carding, drawing and slubbing will go a great ways in getting a good even yarn. The condition of the roving from day to day will make a great variation in the yarn. It makes no difference whether the yarn is dyed or undyed, the variation will be the same, that is, about half a number. One day it might be 10.25, another day 9.75 or even 9.50. If single roving is used there will be a greater variation than with the double roving.

Among the many causes for variation in yarn are long and short staple cotton, poor mixing, bad carding, uneven drawing, etc., all of which make it very difficult for the spinner to spin a yarn that will be 10s, 20s or 30s all the time. Gamaliel Gaunt.

Oily Odor on Finished Goods

I am sending you two swatches of knit cloth. One is about 60 per cent. wool and wool stock, the rest cotton, and the other is all cotton. I am using a soap made of 50 pounds good palm oil soap, 75 pounds alkali, 180 gallons water, and am using 12 gallons to 90 to 100 pounds of goods. The goods are all right when they are first finished, but after being boxed and lying four or six weeks they smell oily.

Waveland (1908).

The following is a good formula for making soap: Have two tanks, one for palm oil soap and one for olive oil soap or green soap. The tanks should hold about ninety gallons of water. Fill half full and add sixty pounds of palm oil soap and in the other tank add sixty pounds olive oil soap. Boil both solutions until they are well dissolved and then run up the tanks full of water, adding thirty pounds ammoniated potash and boil for two hours, when the soap is ready to use.

To treat eighty pounds of goods first use six gallons of palm oil soap, or two pailfuls of

olive oil soap. It will be easy to get at the cost. One hundred pounds of goods is too much for any fulling mill to attempt to full at one time. I have always had good results and there is no odor from the goods. Howard.

Marking Buttons for White Goods

We have difficulty in marking buttons for white goods. If we use red or blue pencil the marks will not come off. Kindly give us some information on this subject.

Dawson (1189).

It does not seem possible that anyone could get into difficulty over such a trifle as marking buttons, and the best advice I could give would be to weed out some of the help. I might say, however, that I never allow a colored pencil to be used for button marking except on black goods. On all other goods the markers use a common lead pencil, making a small dot where the button is to be sewed on. A little care in sharpening the pencil so that the lead does not show through the wood too far is all that I have found necessary. Madison.

. . .

For marking the place to sew on buttons we have always used an ordinary soft black pencil, making a small dot where the button is to be sewed on. With a little care the button could be sewed right over the dot. This is

done on all balbriggan underwear. However, I would suggest that "Dawson" get crayon or chalk pencils, like tailors' chalk, which will not only rub off, but can also be brushed off.

Lafayette.

Machines, Yarn Sizes and Piece Work Prices for Hosiery Knitting

Can you give me any data on the sizes of machines to use for different classes of work, including the gauge of the needles, size of yarn, weight of goods and piece work prices?

Cole (2106).

During my somewhat extensive experience in the manufacture of hosiery I have collected data on the sizes of the machines to use for different classes of work, including the gauge of the needles, size of yarn, weight of goods and piece work prices.

Misses' or boys' 1 by 1 ribbed leg, plain foot, weight 1 1/2 pounds a dozen, for size 7 1/2 inch, sizes 5 to 9 1/2 inches.

Yarn for legs, 2/34s combed Egyptian cotton.

Yarn for feet, 1/14s combed Egyptian cotton.

Needles for cylinder of ribbers, 36 gauge with a 42 gauge hook.

Needles for dial of ribbers, 48 gauge.

Needles for footers, 42 gauge.

Sizes of machines for legs:

Diameter of cylinder	No. of needles.	Size of stocking.
3 3/4 inches	96	5 - 5 1/2 inches
4 "	108	6 - 6 1/2 "
4 1/4 "	120	7 - 7 1/2 "
4 1/4 "	132	8 - 8 1/2 "
4 3/4 "	144	9 - 9 1/2 "

The number of needles given above are for the cylinder only. As the rib is 1 by 1, the dials will have the same number of needles also.

Sizes of machines for feet:

Diameter of cylinder.	No. of needles.	Size of stocking.
2 1/2 inches	96	5 - 5 1/2 inches
2 3/4 "	108	6 - 6 1/2 "
3 "	120	7 - 7 1/2 "
3 1/4 "	132	8 - 8 1/2 "
3 1/2 "	144	9 - 9 1/2 "

As the footers have the same number of needles as the cylinders of ribbers, in transferring the stitches of the ribbed legs to the footers, two stitches will be required to go over each needle.

Approximate Piece Work Prices

Knitting legs	.03 per dozen
Knitting feet, (including transferring of legs)	.18 " "
Looping	.0475 " "
Mending	.03 " "
Dyeing (black)	.07 " "
Finishing, which includes boarding, drying, inspecting, folding and boxing	.07 " "
Boxes (2) for 1 dozen	.04 " "
Cases and shipping	.015 " "

Misses' or boys' 1 by 1 ribbed leg, full fashioned heel and foot—sizes 5 to 9 1/2 inches:

Yarn for ribbed legs, 2/35s combed Egyptian or 2/36s lisle.

Yarn for heels, 2/35s combed Egyptian with an additional splicing thread of 1/100s combed Egyptian.

Yarn for feet, 2/30s combed Egyptian.

Weight per dozen on size 7 1/2 inches, 1 pound 10 ounces.

Needles for ribbers; cylinder, 36 gauge with 42 gauge hook; dial 48 gauge.

Heels and feet knit on German full fashioned flat footers and heelers, gauge 36.

Legs on Circular Rib Machines

Diameter of cylinder.	No. of needles in cylinder.	Size of stockings.
3 1/4 inches	104	5–5 1/2 inches
3 1/2 "	112	6–6 1/2 "
3 3/4 "	120	7–7 1/2 "
4 "	128	8 "
4 1/4 "	136	8 1/2–9 "
4 1/2 "	144	9 1/2 "

As the rib is 1 by 1, the dials will have the same number of needles as cylinders.

Piece Work Prices per Dozen

Knitting legs	.03
Knitting heels	.035
Marking	.01
Topping heel	.05
Topping feet	06
Knitting feet	.08

Inspecting	.015
Looping	.05
Seaming	.03
Turning twice	.01
Mending	.03
Pulling ends	.005
Dyeing (black) including dyestuffs	.0625
Singeing	.01
Sorting	.0025
Boarding	.02
Pairing	.01
Folding and boxing	.01
Stamping	.005
Boxes (two for 1 doz.)	.04
Cases and packing	.015
Total	.58

Boys' heavy 1 by 1 ribbed legs, plain foot, sizes 6 to 9 1/2 inches:

Yarn for ribbed legs, 3 threads, 1/16s carded cotton.

Yarn for heels, 2 threads 1/12s carded cotton with 1/60s splicing thread additional.

Yarn for feet, 2 threads 1/12s cotton.

Weight per dozen, 4 1/2 pounds on 9 1/2 inch.

Needles for ribbers, 18 gauge cylinder, 24 gauge dial.

Needles for footers, 24 gauge.

Legs on circular rib machines:

Diameter of cylinder.	No. of needles in cylinder.	Sizes of stockings.
4 1/4 inches	66	6 and 6 1/2 inches
4 3/4 "	72	7 and 7 1/2 "
5 "	75	8 "
5 1/4 "	78	8 1/2 and 9 "
1/2 "	81	9 1/2 "

The dials have the same number of needles as binders.

Footers on 3/4 automatic circular machines:

Diameter of cylinder.	No. of needles in cylinder.	Sizes of stockings.
2 3/4 inches	100	6 and 6 1/2 inches
3 "	108	7 and 7 1/2 "
3 1/4 "	120	8 and 8 1/2 "
3 1/2 "	128	9 and 9 1/2 "

It will be noted that the footers have about 30 less needles than the ribbed leg cylinder and dials together. The extra stitches in transferring the ribbed leg to footer are placed 2 stitches on one needle at the back part of the stocking where the heel is, which gives an extra thickness at the back of the foot, as the rib part is thus prevented from being stretched apart as much as the front part of the stocking.

Piece Work Prices per Dozen

Knitting leg	.03
Footing, including transfer of legs	.16
Looping of toes	.0375
Mending	.02
Turning	.01
Inspecting	.01
Dyeing (black) including dyestuffs	.18
Finishing, which includes boarding, pressing, sorting, pairing, folding and boxing	.05
Boxes (2 to the doz)	.05
Cases and packing	.015
Total	.56 1/4

Ladies' plain hosiery, using 3/4 or full automatic circular machines:

Yarn, 1/18s cotton.

Weight, 2 lbs. to the dozen.

Needles, 42 gauge.

Splicing thread in heel, 1/60s cotton.

Cylinder, 4 in., 208 needles.

Piece Work Prices per Dozen

Knitting 3/4	.07 full .05
Looping	.0475
Welting	.02
Mending	.02
Inspecting	.0125
Turning	.005
Dyeing (black, including dyestuff)	.08
Boarding	.015
Pressing	.005
Sorting	.005
Pairing	.0075
Folding	.0075
Boxing	.01
Boxes (one)	.025
Cases and packing	.015
Total	.34 1/2

Men's half hose:

Yarn, 1/18s cotton.

Weight, 1 1/4 lbs. to a dozen.

Needles for ribbers, 36 gauge, 42 gauge hook for cylinder, 48 gauge for dial.

Tops, 1 by 1 rib.

Diameter of cylinder.	No. of needles in cylinder.	Sizes of stockings.
3 3/4 inches	96	9 1/2 and 10
3 3/4 "	100	10 1/2 and 11

Legs and Feet

3 3/4 inches	192	9 1/2 and 10
4 "	200	10 1/2 and 11

Piece Work Prices per Dozen

Knitting leg and foot, including transfer of top	.15
Looping	.0475
Mending	.02
Inspecting	.0125
Turning	.005
Dyeing (black, including dyestuff)	.05
Boarding	.015
Pressing	.005
Sorting	.005
Pairing	.0075
Folding	.0075
Boxing	.01
Boxes (two)	.05
Cases and Packing	.015
Total	.41

Boys' 4 by 1 ribbed legs: Plain foot, sizes 6 to 9 1/2 inches.

Yarn for legs, 1/7s cotton.

Splicing thread for heel, 1/20s cotton.

Yarn for feet, 1/9s cotton.

Weight of ribbed legs, 1 lb. 12 1/4 ozs. on 9 in.

Weight of whole stocking on 9 in., 2 lbs. 5 1/2 ozs.

Ribbers

Diameter of cylinder.	No. of needles in cylinder.	No. of needles in dial.	Sizes of stockings.
4	100	25	6 and 6 1/2 in.
4 1/4	104	26	7 and 7 1/2 in.
4 1/2	108	27	8 and 8 1/2 in
4 3/4	112	28	9 and 9 1/1 in

Footers

3	104		6 and 6 1/2 in.
3 1/4	112		7 and 7 1/2 in.
3 1/2	120		8 and 8 1/2 in.
3 3/4	128		9 and 9 1/2 in.

All weights given are as knitted and before dyeing.

Boys' 2 by 1 ribbed legs. Plain foot, sizes 6 to 9 1/2 inches.

Ribbers

Diameter of cylinder.	No. of needles in cylinder.	No. of needles in dial.	Sizes of stockings.
4	100	50	6 and 6 1/2 in.
4 1/4	104	52	7 and 7 1/2 in.
4 1/2	108	54	8 and 8 1/2 in.
4 3/4	112	56	9 and 9 1/2 in.

Footers

3	104		6 and 6 1/2 in.
3 1/4	112		7 and 7 1/2 in.
3 1/2	120		8 and 8 1/2 in.
3 3/4	128		9 and 9 1/2 in.

Needles, 18 gauge for cylinders, 24 gauge for dials.

Legs, 1/11s cotton; weight per dozen, 1-3 7/16 ozs.

Feet, 1/10s cotton. Total weight per dozen 1-11 3/8 ozs. on 9 in. size.

Boys' 1 by 1 ribbed legs. Plain foot, sizes 6 to 9 1/2 inches.

Ribbers

Diameter of cylinder.	Needles in cylinder.	Needles in dial.	Sizes of stockings.
3 1/2	84	84	6 and 6 1/2 in.
3 3/4	88	88	7 and 7 1/2 in.
4	92	92	8 and 8 1/2 in.
4 1/4	96	96	9 and 9 1/2 in.

Footers

3	104		6 and 6 1/2 in.
3 1/4	112		7 and 7 1/2 in.
3 1/2	120		8 and 8 1/2 in.
3 3/4	128		9 and 9 1/2 in.

Legs, 1/12s cotton.

Weight per dozen, 1 lb. 4 5/16 ozs.

Feet, 1/10s cotton. Total weight per dozen, 1 lb. 12 3/8 ozs. for 9 in.

Same machines:

Legs, 1/10s cotton.

Weight per dozen, 1 lb. 9 1/2 ozs.

Feet, 1/9s cotton. Total weight per dozen, 2 lb. 3 7/8 ozs.

For heavier 1 by 1 ribbed legs:

Ribbers

Diameter of cylinder.	Needles in cylinder.	Needles in dial.	Sizes of Stockings.
3	54	54	6 and 6 1/2 in.
3 1/4	60	60	7 and 7 1/2 in.
3 1/2	66	66	8 and 8 1/2 in.
3 3/4	72	72	9 and 9 1/2 in.

Footers

2 3/4	96	6 and 6 1/2 in.
3	104	7 and 7 1/2 in.
3 1/4	112	8 and 8 1/2 in.
3 1/2	120	9 and 9 1/2 in.

Legs, 2/16s.

Weight per dozen, 2 lbs. 4 1/2 ozs.

Feet, 1/7s cotton.

Total weight, 2 lbs. 13 3/4 ozs.

Ladies' seamless plain hosiery:

Ribbers

Diameter of cylinder.	Needles.	Size of cotton yarn.	Weight per doz for 9 1/2 in. lbs.	ozs.
3 3/4	96	1/8	1	12
3 3/4	96	1/7	2	1
3 3/4	96	1/5 1/2	2	7
3 3/4	128	1/8	2	4
3 3/4	176	1/13	2	
3 3/4	184	1/12	2	3 3/4
3 3/4	184	1/14	1	15 1/4
3 3/4	152	1/12	1	13 1/4

Ladies' cashmere plated hosiery:

Diameter of cylinder.	Needles.		Weight lbs.	ozs.
3 3/4	128	1/23s cashmere (worsted)	2	14 7/16
3 3/4	176	1/35s worsted		
		1/20s cotton	2	7 13/16
3 3/4	176	2/30s all worsted	2	7 13/16
3 3/4	176	2/35s all worsted	2	2 3/4

Raritan.

Knitting Horsehair

Can you give us the names of manufacturers of knitting machinery for knitting horse hair? Also give us an account of the process.

Knitter (1255).

Patient inquiries in several directions have failed to produce any positive result. The horsehair firms do not know of the use of their yarns by machine-knitters and the leading firms of knitting machine makers in England and on the Continent can throw no light on the matter. Inquiries made of the patentees of "Laptair," a spliced horsehair yarn which has been already described in the Textile World Record, show that it is not suitable for machine knitting. The ends of the hairs are like little hooks and cannot be drawn round the needle. I thereupon procured balls of 2-fold horsehair spun yarn, of about 200 yards to the pound and costing 36 cents. By the courtesy of Wildt & Co. of Leicester, Eng., this has been tried in different machines, but not to good purpose. They report:

"We have made several trials, but cannot say it is satisfactory to knit on a machine as the hair gets entangled in the hooks of the needles. Some time ago we made trials for Norwegian manufacturers who intended to make slippers from horsehair, but we could not succeed."

I forward a skein of the yarn employed, but in 3-fold horsehair, also a bit of goathair yarn made by Edward Webb & Sons, Ltd., Worcester, Eng. The goathair might be more knitable but might not answer the inquirer's purpose.

The purpose to which the horsehair is to be put is not stated. In case the idea should be to make flesh-rubbers it may be said that those sold in this country (England) are woven. Rubbing bands and gloves are woven with a pile which in some cases is cut and in others left in the loop. A pleasing appearance is lent them by striping in black, brown and white hair. James Strand.

Formula for Scouring Worsted Yarns

Kindly publish the best formula for scouring Oxford worsted knitting yarns.

Chester (1089).

In scouring Oxford yarns so as to retain the soft feel I have always found the following method to give good results: For the best quality yarns treat with olive oil saponified with caustic soda. This used with ammoniated soda gives a good scour. For low quality yarns I have used a good cocoa oil saponified for the soaping process. This has a tendency to leave a smell of cocoa, but if

the oil is not used too strong and is thoroughly washed out it will not be noticed.

The following is a steeping process which I have used to advantage on worsted goods: Dissolve 50 lbs. aqua ammonia in 80 gals. of water; then dissolve 25 lbs. of good soap in 25 gals. of water with 10 lbs. of borax. Mix the two liquors together. After steeping the goods in the liquor very little scouring will be necessary. Dulcimer.

Treatment of Hard Water in Bleaching

We are enclosing an analysis of water. Would this water be suitable for bleaching cotton knit goods? If not, how could it be treated to make it so.

Contains.	Grains per Gallon.
Silica	1.9244
Iron and Alumina	.1633
Sodium Chloride (Salt)	.2216
Sodium Sulphate	.6123
Potassium Sulphate	.3966
Calcium Carbonate (Carbonate Lime)	2.2978
Magnesium Carbonate	.4082
Total Solids by Evaporation	6.1350

Matthew (1926).

In bleaching cotton knit goods it is advisable to use as pure a water as possible. The reason for this is not only to effect an economy in the use of the chemicals employed for the actual bleaching and boiling out processes, but

also with an idea of obtaining a better quality of bleached fabric. The softer and cleaner the water used, the softer and cleaner will be the resultant cloth after bleaching. From the analysis of the water as given in the inquiry, I would say it would be classified as a moderately soft water, but from the fact that it contains quite an appreciable quantity of iron, it is likely to give trouble in boiling out and bleaching. If the iron were removed and the water also properly softened, it would be very good to use in bleaching.

While it could be used untreated and perhaps quite satisfactory results obtained, if the knit goods are bleached on the open run, nevertheless, I would recommend that the water be filtered. The best kind of filter to employ for this purpose would be a sand-pressure filter provided with an alum cell so that the iron could be completely removed as the water passes through the filter. Such filters can be obtained from specialists in this line of work. Before the prospective manufacturer decides definitely on this matter it would be best for him to take the advice of a suitable consulting chemist experienced in the matter of bleaching cotton goods. Howell.

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A sample of water shows upon analysis to contain

	Grains per Gallon
Silicia	1.9244
Iron and Alumina	.1633
Sodium Chloride	.2216
Sodium Sulphate	.6123
Potassium Sulphate	.3966
Calcium Carbonate	2.2978
Magnesium Carbonate	.4082
Total solids of evaporation	6.1350

This water is not unsuited for hosiery bleaching, provided the quantity of iron present does not materially increase. The figure (.1633) given in the analysis is for both "iron and alumina," with the presumption in favor of the alumina predominating, in which case no serious results will be had. The analysis shows that the "hardness" of the water is about 3 1/2°, which is comparatively low, and which could hardly be improved to advantage.

The iron can be practically removed by aerating the water, that is, arranging a sort of fountain or spray so that the water in fine particles comes in contact with the air which then oxidizes the iron to the insoluble ferric state, when it is removed by sand or other form of filtration.

A simple means exists for purifying water by the quick adding of chemicals. The commonest water purifying system is based upon

the use of caustic soda and milk of lime, both in very small quantities, calculated upon a number of analyses, and which cause a most complete removal of dissolved impurities, including iron, which is the most objectionable impurity from the bleachers' point of view.

Beta Naphthol.

Oiling Yarn

What is the most approved method of oiling the yarn before knitting? We have tried paraffining by hand, but it is too slow. We have tried oiling it with liquid petroleum and found it gave satisfaction when we could get it on the yarn with any degree of uniformity. We used sight feed oil cups which dripped on to a sponge over which the yarn ran on the spooling machine. We found this satisfactory up to a certain point. The sponge would wear out and get clogged with dirt and we could not depend on the operators to keep the oil feed regulated properly. Is there no attachment for winders for oiling or waxing yarn in a satisfactory manner? Hastings (1288).

A good method of oiling is that of running the yarn over a roll which revolves slowly in a trough containing emulsion. The speed of the roll as related to the linear speed of the yarn, the size of the roll, the length of the yarn in contact with the angle of contact, and also the height of emulsion in the trough are all determining factors as regards the moistening of the yarn. Jacob K. Altemus makes au-

tomatic paraffine waxing attachments for winders.

The proper conditioning of the yarn is very important and the amount of moisture to be used should be determined by careful experiments. Undoubtedly one of the reasons why American made goods do not have the soft finish of imported fabrics is because we do not often soften our yarns before knitting. No amount of labor in finishing will ever even the length of stitches which have been unevenly drawn in knitting. Elibank.

Equivalent Counts of Single and Ply Yarn

We would like to have you explain a method of finding what numbers are required for fine yarns when used double or treble to make the same weight of knit goods as a coarse single yarn will make. Can you help us? Acropolis (1193).

The problem is very simple if the two or three-ply yarns consist of single strands of equal size. We will assume that the yarn is numbered by the fixed weight system of counts:

Ex. What is the count of the yarn required for two-ply cotton yarn to equal a single 20s?

$20 \times 2 = 40$s, count required.

Ex. What is the count of the yarn required for a three-ply cotton yarn to equal a single 15s?

$15 \times 3 = 45$s, count required.

If the yarn is numbered by the fixed length system the calculation will be as follows:

Ex. What is the count of the yarn required for a two-ply cotton yarn to equal a yarn weighing 50 grains per 120 yards?

$50 \div 2 = 25$ grains, count required.

Ex. What is the count of the yarn required for a three-ply cotton yarn to equal a yarn weighing 66 grains per 120 yards?

$66 \div 3 = 22$ grains, count required.

The method of calculation is the same regardless of the particular weight or length on which the count may be based. Thus, the first calculation would be the same for runs, worsted, linen or other fixed weight system of numbering yarn. Likewise the second calculation would be the same for grains per 100 yards, 50 yards, drams per 1,000 yards, deniers per 400 aunes, or any other fixed length system of numbering yarn. This applies also to the calculations which follow.

If the two or three-ply yarn consists of single strands of different sizes the calculation is as follows when numbered by the fixed weight system:

Ex. What is the count of single cotton yarn that must be doubled with single 40s to equal single 15s?

$(40 \times 15) \div (40 - 15) = 24$s, count required.

Ex. What is the count of single cotton yarn that must be run with a single 40s and a single 24s to equal a single 12s?

We first find the count of the 40s and 24s:

$(40 \times 24) \div (40 + 24) = 15$s.

Then the question is to find what count must be run with 15s to equal single 12s:

$(15 \times 12) \div (15 - 12) = 60$s, count required.

If this yarn is numbered by the fixed length system the calculation is as follows:

Ex. What is the count of single cotton yarn that must be doubled with 25 grain (per 120 yards) yarn to equal a single 66 grain yarn?

$66 - 25 = 41$ grains, count required.

Ex. What is the count of the single yarn that must be run with a 25 grain and a 41 grain yarn to equal an 83 grain yarn?

$83 - (41 + 25) = 17$ grains, count required.

If the yarns are numbered by different systems it is necessary to reduce them to a common basis.

Ex. What is the count of single cotton yarn that must be doubled with single 60s worsted to equal single 15s cotton?

60s worsted = 40s cotton.

Then:

$(40 \times 15) \div (40 - 15) = 24$s cotton, count required.

Lisle Yarn

What is the correct definition of a lisle yarn and when was it introduced into the United States? Lombard (1002).

The term lisle thread originated at Lisle (Lille), France, and refers to a very fine hard twisted yarn made for the cotton glove trade. The glove cloth was noted for the remarkable fineness of texture, and almost entire absence of loose fibers on the fabric. Later this class of yarn was used in the manufacture of hosiery. It will be of interest to note the extensive application of this term, which at the present time is used in many instances to designate merely the smooth fiberless appearance of the fabric, even when produced from coarse and interior yarns. Instances of this are found in the manufacture of low grade hosiery, made from common carded yarns, which are subsequently lisled in conjunction with the dyeing process, as in the oxidation aniline black, by which the fibers are chemically burned and rubbed away, thus producing a clear foundation to the fabric, similar in effect to that produced by the use of a combed yarn of much finer count as employed in the real lisle products. I have no data as to when this class of yarns were first introduced into the United States. Palmetto.

Preparation to Prevent Rusting

We have in our mill an English hand knitting frame that is sometimes standing idle for months at a time. We have considerable trouble from the sinkers and needles rusting. What kind of grease is used on machines to prevent rusting, such, for instance, as is used on machines packed for transportation by European manufacturers? Berkley (1150).

It is difficult to state what grease is put on English machines when packed for a salt water voyage, as almost every firm uses a different compound. The best preparation I know of is a mixture of tallow and whiting, but some firms use a compound of mineral residium grease with a certain amount of wool grease, while others use almost anything they can pick up which can be called grease. There has been a good deal of complaint lately on this side of the water on account of the grease arriving on some English machinery being so hard to clean off. Southdown.

Depreciation of Machinery in Knitting Mills

Will you kindly give me particulars of the rate of depreciation that should be charged against the machinery of a knitting mill?
Stone (2107).

The depreciation of machinery in a knitting mill and the percentage that should be

allowed annually depends a good deal on the class of machinery, on the employes whose work it is to keep the different machines in repair and working order, and also on the ideas and views of the proprietors of the mills. Certain classes of machines depreciate in value more rapidly than others owing to the radical improvements being made on them from time to time, which render the older machines absolutely worthless. Again the value of other machines in which only slight improvements are made can be maintained unimpaired by adding these improvements.

In the last twenty-five years hosiery machines have depreciated in value more rapidly than any other class of knitting machinery owing to the rapid and radical improvements. Twenty years ago we had what was called the hand stocking machine that was considered remarkable in its line. It was operated entirely by hand power. The first improvement on these was to add machine power for knitting the leg part of the stocking. This improvement caused the first machines to be practically worthless, as they could not be adapted to power. A new machine had to be built and whereas it required an operator to each hand machine one girl could attend to two or three power machines. Improvements have been made very rapidly from the old

hand machine to the 1/2, 3/4, 7/8, 15/16, and finally to the full automatic machine of today. These are operated entirely by machine power and require only a slight supervision and to be kept supplied with yarn.

Each stage in the development has been marked by sudden depreciation in the value of the older machines. Even now that these machines have reached the full automatic stage, improvements are still going on so as to make them more durable, or less liable to get out of order, or to save wear and tear on the needles. On this class of machines a manufacturer should deduct at least 10 per cent. annually so as to wipe out the cost in ten years.

Spring needle knitting machines depreciate very little. While there has been quite a number of improvements on this class of machines in the last twenty years, still they have been in the nature of improved parts, and the construction is such that an old part could be removed and the new improved part put in its place. A manufacturer who has kept abreast of the times and purchased these improved parts from time to time, and replaced with new parts those which wear, has today practically up-to-date machines, which are just as good for manufacturing purposes as a new machine made at the present time.

I have known spring needle machines, twenty years old, which had been kept in thorough repair and condition, to be sold for 75 per cent. of the original cost.

Manufacturers who have this class of machines and who see that they are kept in good condition, will not need to allow more than 3 per cent. annually for depreciation. All new or improved parts that have replaced others are charged to "repairs" account, which is quite proper, as the new improved parts do not add to the cost value of the machine, only so far as they prevent the value depreciating.

Certain makes of sewing machines are another class of machine that do not depreciate very rapidly provided new parts are constantly procured to replace the worn out parts.

There are some manufacturers, however, who boast of their repair account being small, because when a part breaks or is worn considerably, instead of buying a new part, the fixer is told to patch it up so it will run, which he does, with the result that in a few years the machine is of no value except to be thrown out for old iron. It is false economy to patch up a broken part of a machine. Fixers often remark, "Well, I patched up that all right and it is stronger than before." Yes, no doubt that is true, but I have found from experience in the running of machines this way, that the

fixed up part, which is now stronger, will cause the breaking of another part, which would not have broken had a new part been put in instead of patching up the broken one.

This principle applies to nearly all kinds of machinery, and it may be stated generally that it does not pay to patch the machine, but that it is cheaper and better in the end to replace all broken and worn out parts with new ones and in this way keep up the condition and value of the machine. Take sewing machines as a whole. I think 5 per cent. annually is sufficient to cover depreciation.

Cop winders depreciate very little. The chain parts and the shaft boxes are the parts that wear out first and these are easily replaced with new. Then the spindle sockets and bearings are other parts that wear, causing the spindles to run untrue. Still good bobbins can be wound, even when these are considerably worn with long use, so that 5 per cent. annually would be ample to allow for the depreciation of this class.

Washing machinery depreciates rapidly from the rotting of the wood as well as from greatly improved labor saving machines that are being brought out from time to time, so that for this class not less than 10 per cent. should be allowed annually.

Generally speaking, therefore, the deprecia-

tion of machinery depends upon whether the machines have been rapidly improved or not and also whether they have been continually kept in good repair and in good working condition. Raritan.

Removing Oil Spots

I am having trouble in removing spots of machine oil from socks that are to be bleached snow white. I can eventually remove oil by hard rubbing. I am enclosing a sample of the goods. How can the difficulty be remedied?
Bleacher (1227).

I am returning the samples of knit goods which I have treated in the following manner, with the following solution:

Aqua ammonia, 1 quart; best white soap, 1 pound; saltpeter, 2 ounces, and 2 gallons of soft water. Dissolve the soap and saltpeter in the water when boiling, let it stand until cold, then skim and add the ammonia. Soak the goods that are stained in the above solution for twelve hours, then proceed to bleach in the regular manner. If the oil is very strong it might be necessary to rub the goods lightly. The samples returned have not been rubbed. The above solution will not tender the finest fabric. Keeping the oil off the goods will pay better than the most economical method of removing the spots. Alpha.

Crooked or Twisted Hosiery Knitting

We are having difficulty in knitting ladies' hosiery straight. We use 24 single mule yarn. Please state how to remedy this trouble.

Monton (997).

No circular knitting machine knits straight for the reason that each course of loops upon the preceding course are knit in a spiral manner like the thread of a screw. On circular machines where sinkers are used and there are no weights or take-up to roll up the cloth as knit, the natural effect of the circular knitting is shown. Light, flimsy knitting like the sample sent shows the spiral effect more than it does on heavier and closer knit fabrics. On circular machines where weights or take-ups are used, this spiral effect is not noticed, but when the cloth is unrolled it will run in a spiral manner. On underwear this is remedied and straightened after the cloth has been wet and dried. On hosiery it is straightened when the stockings are boarded. The only remedy is to run the knitted fabrics through take-up rollers on to a roll. This does not alter the effect of the spiral knitting, but merely keeps it straight after it is knit. The roll when unwound will still have a tendency to go back to the spiral effect. Lafayette.

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This is a very difficult question to answer

without knowing what particular make of machine the stocking was knit on. What will cause this on one machine may not result in any difficulty on another. However, I will endeavor to give the principal causes and remedies which I have found for this defect and Monton may be able to derive some benefit from the suggestions. The first and main cause for this defect is usually found in the needle cylinder not being milled true. If the cylinder is perfectly true and all needles making exactly the same stitch, the work must come straight. If the slots in the needle cylinder are tight and the needle does not work free it will cause the needle to bind and will not allow the stitch cam to act upon the needles freely. This causes the stitch cam to act more indirectly upon the needle and will throw the cam out of line with the sinker ring or head of machine. This can only be remedied by remilling or filing out the needle slots in the cylinder so as to make the needles work free.

The same trouble may also be caused by the outside sinker ring not being in line with the inside ring or top of needle cylinder as the case may be. The needles being tight in cylinder the stitch cam or the shank of the needle is thrown out of line with the sinkers or hook or needle. This, however, is easily remedied by resetting the sinker ring.

Frequently, however, the machine is found to be perfect and still we find it will not knit straight. In such cases the fault lies in the yarn being twisted too tight. This is especially true on fine gauge machines where single carded yarn is used. In such cases relief is sometimes secured by steaming the yarn. This has a tendency to soften the yarn and the strain is taken from the cotton fibers. All yarns which have an exceptionally hard twist have a tendency to creep. They have the same tendency to after being knit as before. It is this constant creeping or twisting of the fibers which causes the goods to look as though they were knit crooked, while in reality they were knit perfectly straight. The best remedy for this trouble is to place a take-up roller on the machine, as is used on ribbers. By keeping a steady pull on the work it will come through perfectly straight. We have equipped all of our machines, on ladies' hose, with these rollers and have had no trouble with crooked or twisted hose since.

Dan Bucklin.

Scrooping of Mercerized Hosiery

Kindly inform us how we can obtain a scroop finish on fine 240-needle goods with soft mercerized yarn, like that on the enclosed samples. Knitter (1285).

In order to obtain a scroop finish on cotton proceed as follows: Wash off after dyeing and handle 1/4 to 1/2 hour at 120° F. in a bath containing 5 to 10 per cent. soap, figured on the weight of the goods. Squeeze or hydro-extract, but do not wash, then put into a bath made up of 5 per cent. tartaric acid or 10 per cent. acetic acid, 1/2 hour cold. Then rinse.

Renmark.

Trimmers on Loopers

Would you suggest putting trimmers on loopers in a hosiery mill and if so please state your reasons? Allen (1111).

I have found it advisable to use trimmers on all loopers in hosiery mills, as there is an increase in production of from 50 to 75 per cent. The cost of looping is reduced from 50 to 75 per cent. Unless trimmers are used it is necessary for the looper girl to ravel her own work, or have extra girls for raveling. If the former method is used the looper girl will not be able to close more than 20 to 25 dozen per day of 180 needle work. The cost of looping will be about 7 cents per dozen. If trimmers are used the same girls can close from 35 to 40 dozen per day at a cost of 4 cents per dozen. If extra girls are employed to do raveling, one girl will ravel for 2 or 3 loopers and the extra cost will be about 2 cents per

dozen. I have found the trimmers to be thoroughly practical and to increase the production of the loopers, reduce the cost of looping per dozen, reduce the number of loopers required to operate, and reduce the amount of help required. Merrill.

Temperature for Drying Hosiery

What is the best temperature for drying hosiery previous to boarding? We want the goods left in the best condition to secure a finish. We make 176 and 200-needle carded mule spun and mercerized goods.

Craigie (1905).

A low temperature of 70° or 80° F. is best. Spread the stockings in an open box drier on wire screen shelves and force all the air possible through them from a large fan at the bottom of the drier. Stir the goods up occasionally to prevent their drying out in spots. This also tends to prevent marks where they are creased or folded. This is an excellent method, because it allows the boarders to get out a good production on a moderate heat.

To obtain the best results do not let the hosiery lie around wet after it comes from the hydro-extractor. Winwick.

Softener for Dyed Yarns

What is the best method of making hosiery from mercerized yarn? I have been using

dyed yarns but find them harsh and very apt to make defects in the heel and toe. Should mercerized yarn be twisted as soft as other hosiery yarns? Cherokee (991).

There is very little difference in the manufacturing of hosiery, either in the natural or the dyed yarn. The way the work runs depends upon what class of yarn is used and whether it is properly twisted and softened. Anyone buying mercerized yarn will find it very difficult to get the yarn to run well on the machine. I have found by rewinding and using the following softener that the yarn will run much better:

8 lbs. Olive Oil Soap,
1 gal. Lard Oil (Bleached),
1 lb. Sal Soda.
Add 5 gals. water. Boil for one-half hour and then add water to make 20 gallons.

A tin or wooden roll driven from belt on winder shaft is immersed in a trough filled with the softener and extending the length of the winder. The roll is revolved slowly. The slower the roll revolves the less softener it feeds to the yarn. The roll should run in the opposite direction to that of the yarn. I have used this device on cotton and woolen yarns for a number of years and always found it satisfactory. It is better to make hosiery in

the grey and dye in the goods, as this gives a much better fabric. The twist should be soft hosiery twist, both in the single before twisting and in the ply after twisting. In this way better results are obtained in mercerizing and the yarn runs much better on the machines. I have mercerized single yarns from 8s to 60s with very good results, but it is very slow work and costs double the price of ply yarns.

Ravenswood.

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In making hosiery from mercerized yarn the best method is to knit it in the natural and dye the goods after. Dyed yarns are usually harsh and causes more defects in the knitting and do not take as good a finish as when the goods are dyed after knitting. Single twisted yarns can be mercerized. The twist can be as soft as any other hosiery yarn, in fact a hard twisted mercerized yarn does not show the luster as well as a soft twist. In knitting mercerized yarn very close attention should be given to the tension on the yarn and gauging the stitch on the machine. Profile.

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"Cherokee" is having the same trouble that most manufacturers experience in trying to use dyed yarns. The same trouble is always experienced with dyed yarns, regardless of the quality of the yarn, whether mercerized, lisle

or common carded yarns. In my opinion it is caused more from the dye than from the yarn itself. It is almost impossible to secure as good results in the knitting from dyed yarns as from undyed or natural yarn. The process of dyeing will necessarily make the yarn hard and wiry, and hard to knit. Much depends on the process used for dyeing. Some processes make the yarn much more harsh and hard than others. In latch needle machines considerable trouble is usually caused by the dyestuff coming off and filling the needles, thus making the latches work hard. This alone will cause considerable trouble in heels and toes. In cases where dyed yarns are used the needles should be looked over at least once a week and the latches made to work freely.

Where dyed yarns are used, the rivets in the latches are constantly working loose. The sinkers become badly worn at the point where the yarn is drawn over them by the needle. These needles and sinkers must be replaced with new ones to insure good work. Where it is possible to do so I would advise that goods be knit in the white or natural color and dyed afterwards. In this way better results are obtained from the knitting machines and the cost of manufacturing is reduced to a considerable extent, as there will be less seconds. There will also be a reduction in the

number of needles used and also in the wear on machines.

The cost of dyeing knit goods is also considerably less than the cost of dyeing yarn. In small mills not equipped for dyeing it is sometimes necessary to use dyed yarns. In such cases considerable care should be taken in purchasing the yarns, as dyed yarns not properly treated must necessarily cause a great amount of trouble to the manufacturer. In such cases it is usually much more satisfactory to buy undyed skein yarn and have it dyed. In buying dyed yarns through the commission agents, there is no way of telling where the yarn is dyed. If the yarn proves defective, it is a hard matter to locate the responsibility. On the other hand, by buying yarn in the grey, and having it dyed, there is the advantage of being able to choose the dyer and methods of dyeing. If the dye proves defective the fault is more easily corrected. As before stated, however, all dyed yarns will cause more or less trouble in knitting and especially in heels and toes. Better results are usually obtained by rewinding and running the yarn over a softening preparation, made from soap, warm water and pure olive oil. If impossible to rewind the yarn the same results may be obtained by attaching a small tin cup on top of yarn stand and placing a woolen rag

well saturated with the softening preparation and over which the yarn runs. The woolen cloth can be kept well saturated by keeping the cup filled with the preparation. Great care must be taken in preparing the softener, and only pure olive oil should be used, as other grades may spot the goods. This preparation will have a tendency to liven up the yarn and also lubricate the needles so that the latches will work more easily.

In regard to amount of twist in mercerized yarns, a slack twist will run better and give less trouble in knitting that a hard twist, but will not take as nice a finish. As the finish is usually what the manufacturer is looking for in mercerized goods, they usually prefer a hard twist. The more twist there is in the yarn, the greater the luster by the process of mercerizing. Dan Bucklin.

Removing Mildew

Is there anything that will take mildew out of yarn? We have some yarn which has been mildewed and are going to bleach it. Would this be the proper method to pursue?

Carolina (1181).

Bleaching the yarn will remove the mildew providing it has not gone too deep into the fiber. For removing the mildew without going to the expense of bleaching mix a solution of one pound of chloride of lime to ten

or twelve gallons of water. Steep the yarn in this solution for ten to fourteen hours, according to the amount of mildew on the material. If the goods are heavily mildewed, make the solution a little stronger, say one and one-half pounds of chloride to twelve gallons of water, or let the yarn steep a little longer. I would advise trying a small quantity of the yarn with this solution at the first strength, as there is no danger of this mixture making the yarn tender. Do not use the sediment of this solution, let the mixture settle and use the clear liquor.

If the goods have gone beyond the first stages of mildew, a stronger solution will be required to remove it. The first stage of mildew is pink, then red, and then changing to green and black with a fringe. After the spots are removed wash the goods thoroughly so that no trace of the chloride is left. Then either bleach to a white or dry the goods for other processes. Delco.

Pressing Half Hose to Give Good Luster

Kindly give us some information on the pressing of men's mercerized half hose, and particularly the method used in retaining or adding to the high luster. Canton (1207).

There has been much discussion of this question, builders of different presses main-

taining that the best results can be obtained by the use of their respective machines. Some manufacturers use the hot, hollow plate press, some, the roller press; others, the cold plate press; and others the steam, paper press.

In my own experience I have been able to secure a better luster by the use of the hot press. At the present time we are pressing the goods first on the roller press, then pressing them the second time on the hot, steam paper press at a temperature of 155° to 165° F. It is important to keep the press at a uniform temperature, as I have found that too much heat has a tendency to bake the goods, giving them a hard and dead finish. The best results are obtained at about 160° F.

The luster of the goods is sometimes lost by the action of the dye. I have found that the dyeing process has more to do with the finish of the goods than the pressing. The luster once destroyed in the dyeing can never be restored by pressing. There are also numerous other conditions which affect the luster to a great extent, such as quality of yarn, twist and tension and gauge of goods.

The three grades of mercerized yarns most generally used at present are combed peeler, combed Egyptian and combed Sea Island. Of these grades the combed peeler is the cheapest and will show the poorest luster. The combed Egyptian is the medium grade and the

one most used. This grade will give a better finish than the combed peeler. The combed Sea Island is the best grade, having a long staple and gives a much better luster than any of the other yarns. It will also be found that a hard twisted gassed yarn will give a better finish than a soft twist. The goods will be much smoother, as there are no loose fibers.

The knitting also has much to do with the finish, and a firmly knit hose will take a much better finish than a fabric loosely knit from the same yarn. In order to obtain the best possible results I would advise the use of mercerized combed Sea Island yarn with a very hard twist, knit quite firm, dyed with developed black, and pressed first on the roller press and again on the hot press at a temperature of 160° F. Merrill.

Sewing Tops on Hosiery

Can rib tops for cheap grade socks, 84-needle goods, be sewed on? We have modern machines for knitting, but have trouble in getting the work done satisfactorily. Please state if this is ever done and what class of sewing machines will be required.

Marcellus (1205).

Tops are often sewed on in making this class of goods. For all cheap 76 and 84-needle goods selling at 60 to 70 cents per dozen it is necessary to sew on the tops in order to cut

down on the cost of production. In most cases the toes are also sewed in place of looping. By this method it is possible to reduce the cost from 4 to 6 cents per dozen. However, on the better grades of work it is not advisable to sew on the tops, as it is impossible to get as smooth work as is obtained by transferring. Any of the standard makes of sewing machines can be used successfully. Merrill.

Knitting Bicycle Stockings

What are the sizes of ribbers and footers required for making a boys' bicycle stocking, to be used for boys from six to twelve years of age, and to weigh not more than 2 1/2 lbs. to the dozen, using a 2/12s or 1/6s cotton yarn. Knitter (1236).

The machines used for the manufacture of bicycle stockings will depend largely upon the style of the stocking desired. There are several patterns which may be used in this class of work and these each require different size and gauge. For example we have the plain knit one and one ribbed; also the tuck stitch one and one ribbed. We also have the plain knit, two and one ribbed; also the plain knit two and two ribbed.

The most common grade is the tuck stitch one and one rib. The stockings for a 12 year old boy must necessarily weigh more than for

a 6 year old. I assume, however, that the goods are to average 2 1/2 lbs. per dozen. The correct sizes for the different ages are as follows:

Age 6 to 7 size, 6 leg, size 6 1/2 foot.
Age 7 to 8 size, 7 leg, size 7 and 7 1/2 foot.
Age 8 to 9 size, 7 leg, size 7 1/2 foot.
Age 9 to 10 size, 8 leg, size 8 foot.
Size 10 to 12 size, 8 leg, size 8 1/2 foot.

From this it will be seen that it is necessary to have only three sizes for the legs, 6, 7 and 8, which necessitates three sizes of ribbers. The correct sizes of the ribbers, number of needles and gauges are as follows:

Size 6 = 3 3/4 in. diam., 24 ga. dial, 18 ga. cyl., 66 needles dial, 66 needles cyl.
Size 7 = 4 in. diam., 24 ga. dial, 18 ga. cyl., 74 needles dial, 74 needles cyl.
Size 8 = 4 1/2 in. diam., 24 ga. dial, 18 ga. cyl., 84 needles dial, 84 needles cyl.

It is necessary to knit feet of all sizes from 6 1/2 to 8 1/2. This, however, necessitates having only three different sizes of footers, as sizes 7 and 7 1/2 can be made on the same machine, also 8 and 8 1/2 on one machine. The correct sizes of machines, also the gauge and number of needles for footing on this class of work are as follows:

Size 6 = 2 1/2 in. diameter, 24 gauge, 84 needles.

Size 7 1/2 and 7 = 2 3/4 in. diameter, 24 gauge, 96 needles.

Size 8 and 8 1/2 = 3 1/4 in. diameter, 24 gauge, 112 needles.

Both plain and tuck stitch can be knit on the above machines with equally good results. If a two and one rib or two and two rib is desired the same footers can be used and the cylinders and dials in the ribbers only would have to be changed. If a two and two rib is desired the correct number of needles would be as follows:

Size 6 = 3 3/4 in., 36 gauge needles, 70 needles dial, 70 needles cylinder.

Size 7 = 4 in., 36 gauge needles, 78 needles dial, 78 needles cylinder.

Size 8 = 4 1/2 in., 36 gauge needles, 88 needles dial, 88 needles cylinder.

Merrill.

Finishing Mercerized Hosiery

What is the best method for finishing mercerized hosiery? Would you recommend a hot or cold pressing or a combination of both?

Sampson (1076).

Mercerized hosiery should not be allowed to remain around the mill for any length of time, or tied up in bundles, as this will cause creases

which no amount of pressing will take out. When the goods are dyed and well extracted they should be boarded at once, otherwise the stockings will not show the luster they would if boarded while damp. They are boarded and dried in a steam press and drier. If proper care is taken the dryer will not injure the delicate shades as much as is the case from coming in direct contact with the iron in the steam press. The goods are then mended and placed between card boards and put in a hot press which has hollow plates. The steam is turned on for an hour, after which let the stockings cool before taking out. Avoid too much heat, as this is bad for the shades.

Henry Nevis.

New Sizes of Men's Union Suits

Can you give me the latest sizes for men's union suits? Weymouth (1281).

It is impossible to fit all men from any line of combination suits. Given two suits the same size, one can take two men and fit them perfectly so far as the body is concerned, and at the same time find that either the legs or the arms, or both, may be too long for one man and too short for the other. So long as men do not grow uniformly, so long will it be impossible to fit every figure with suits made uniformly. The most progressive manufacturers have determined upon their scale of meas-

urements by measuring hundreds of figures and striking an average.

Since publishing the scale of sizes last year it has been found that improvements could be made and that a larger number of men can be fitted from suits made after the following scale:

Width.	Center to crotch.	shoulder Length sleeve.	Inseam.	Width of Leg.
34	13	19	26 1/2	6 1/2
36	14	20	27 1/2	7
38	15	20	29	7 1/2
40	16	21	29	8
42	17	21	28	8 1/2
44	18	22	28	9
46	19	22	28	10

Sizes of Hosiery

Will you publish the standard lengths of ribbed hosiery, cotton and woolen, in all sizes from 4 to 10½ inches, measuring from bottom of heel to top of welt? Also state proper length of rib top on half hose and length of leg in sizes 9½ to 11½ inches?

Adams (1088).

The standard lengths of ribbed hosiery from top of welt to the bottom of heel is as follows:

Sizes: 4, 4½, 5, 5½, 6, 6½, 7, 7½, 8, 8½, 9 9½, 10, 10½.

Inches: 12, 12, 15, 15, 18, 18, 21, 21, 24, 24, 27, 27, 29, 29.

On half hose the ribbed top should run 5½ inches long for all sizes and the length of the leg without ribbed top should measure:

Sizes: 9½, 10, 10½, 11, 11½.
Inches: 7½, 8, 8½, 9, 9½.

Fillmore.

Sizes of Two Piece Ribbed Underwear

Will you please state the sizes that are used for the plain 1 by 1 ribbed underwear?

Weston (1064).

The following is the scale of sizes given by the Western Dry Goods Jobbers' Association for men's plain 1 by 1 ribbed underwear. On this class of goods a stretch of 25 per cent. in width is allowed, which allowance may be increased up to 30 per cent. as the goods run lighter in weight, or decreased with the more rigid fabrics:

Shirts	30	32	34	36	38	40	42	44	46
Neck	16	16	17	17	18	19	20		
Chest	28	29	30	32	34	35	37		
Length	32	33	34	34	34	35	35		
Sleeve	23	23	23	23	23	23	23		
Arm holes	15	16	16	17	18	19	20		
Drawers.									
Waist	30	32	34	36	38	40	42	44	
Hip	29	30	31	32	34	35	37	38	
Thigh	16	17	18	19	19	20	21	21	
Front rise	13	13	13	14	14	14	15	15	
Back rise	17	17	18	19	19	20	20	21	
Inseam	31	31	32	32	32	32	32	32	
Suits.									
Trunk	62	62	64	66	67	68	69	70	

Fillmore.

Stains on Sweater Fabrics

We enclose two pieces of sweater fabrics, which you will note are composed of cotton and worsted. The cotton, for some reason or other, seems to be stained through the fabric. We cannot understand this as it seems to be in the sleeves of the fabric only, the body part being entirely clear. Can you state the cause and remedy? Galox (1219).

The dark spots or discoloration are due to the presence of some acid, possibly sulphuric acid or acetic acid, which has accidentally wet the portions of the fabric indicated, and which changes the bright color of the red to a dirty brown or black. The cause of this defect must be looked for in the dyehouse. The remedy for the damaged garments is to rinse them off in a bath containing a small quantity of ordinary ammonia—say 1 quart to 250 gallons of water. The dyestuff used in dyeing these goods is the well known benzopurpurine, possibly shaded with Congo red, both colors being extremely sensitive to dilute acids.

Berwick.

Sizes of Sweater Coats

Please give us the standard sizes of men's, ladies' and misses' sweater coats.

Buxton (1176).

The following scale of sizes of sweaters are accepted as being correct. These are of course

subject to change as regards lengths of the ladies' goods, as these are being bought in lengths of from 27 inches on 40 up to 39 inches and longer:

Men's Coats

Sizes.	Width.	Length.	Sleeves.	Armhole
34	15	25	19	9
36	16	26	20	9 1/2
38	17	27	20	9 1/2
40	18	27	21	10
42	19	27	21	10
44	20	28	22	10 1/2
46	21	28	22	10 1/2

Ladies' Coats

Sizes.	Bust.	Waist.	Length.	Sleeves.	Arm-hole
34	16	14	27	20	7
36	17	15	28	20	8
38	18	15	29	21	8
40	19	16	30	22	9
42	20	17	31	22	9
44	21	18	32	22	10

Misses' Coats

Size.	Width.	Length.	Sleeve
20	10	14	16
22	11	16	16
24	12	18	17
26	13	20	17
28	14	22	18
30	14½	24	18
32	15	25	19
34	16	26	19

. . .

We are in receipt of your May issue and thank you for the information regarding the

sizes of sweater coats. At the same time, we call your attention to the fact that the party who gave you these sizes evidently forgot that ladies' and misses' coats come in double breasted and single breasted sizes.

Buxton (1195).

I do not see that the proportions of ladies' and misses' sweaters would be any different for double than for single breasted. True there would be the additional cloth in the front of the garment to allow it to lap over, but the measurements are all taken on garments buttoned up, and the fact that a garment is double breasted would not alter its length, width, length of arm, or size of armhole.

Fillmore.

Sizes of Boys' Sweaters

Please give us the standard sizes for boys' sweaters, sizes 24 to 34 inclusive.

Victor (1192).

The most acceptable line of boys' sweaters that we get are made on the following scale of sizes:

Size	24	26	28	30	32	34
Length	15 1/2	16 1/2	17 1/2	18 1/2	19 1/2	20 1/2
Width	11	12	13	14	15	16
Length of sleeve	13	14	15	16	17	18
Size of Armhole	5	5	5	6	6	6

Fillmore.

Assortment of Sizes of Sweater Coats

What is the correct assortment of sizes for men's, women's and children's sweater coats?
Knitter (1942).

After an experience of some years handling coat sweaters, we find that the following scales of sizes sell out fairly even:

	28	30	32	34	36	38	40	42	44
Men's					2	4	3	2	1
Ladies'				1	3	3	3	1	1
Children's	2	3	3	4					

In handling ladies' coat sweaters we notice a heavier sale on the small sizes in red, as against the larger sizes, but this is counterbalanced by selling more of the larger sizes in grey. Fillmore.

Curly Knit Goods

We are having difficulty with the curling of fine knit goods, either silk or cotton for ladies' long gloves. We have tried pasting but this has spotted the goods. We would appreciate very much some suggestions for remedying the trouble. Yosmite (1014).

All flat knitted cloth, that is, cloth knit with one row of needles, will have a tendency to curl. Without starch it will be impossible to get flat cloth to lie as smooth as rib cloth or cloth knit with two rows of needles. It will be necessary to boil the cloth, extract and then

dry over drying frames which wind the cloth back in a roll as fast as dried. Another method is to steam the cloth thoroughly, dry out and iron over hot cylinders, rolling the cloth up as on a drying machine. This method is probably the better way for mercerized and silk goods, as it has a tendency to put more luster on the goods. Badger.

. . .

As a general thing, all knitted cloth if cut just as it comes from the knitting machine, will curl on the sides or edges. The cause is inherent to the fabric. A series of loops one interlaced with the other both above and below impart elasticity to the fabric, whereas woven cloth is composed of two sets of straight threads intersecting each other at right angles.

In many cases knit cloth as it comes from the machine is first wet or scoured and then dried; this prevents curling in cutting. Woolen knit cloth is sometimes cut in the grease as it is taken from the knitting machine; this curls also, both at the edges and also across top and bottom, but the edges are straightened in the process of seaming. Silk knit cloth curls more than cotton or wool. This I think is due to the wiry nature of the silk thread.

Where silk and cotton knit cloths are cut as taken from the knitting machine, there are

two ways to overcome the curling. One is to wet the cloth thoroughly and then roll it over a drying machine. The other way is to steam the roll of cloth until it is thoroughly dampened. This can be done by making a steam-box or chest with a perforated false bottom with steam pipes underneath. This box or chest can be made large enough to hold several rolls of cloth at a time. Then the steam is turned on for at least half an hour, provision being made to carry off the condensed steam so that only the steam comes in contact with the rolls. Water might spot the cloth.

The roll after steaming could be run over a turning machine, passing through a spreader so as to have the cloth of a uniform width on the cutting table. Running the knit cloth over hot cylinder rollers would not prevent the curling unless the cloth was first dampened by steaming. Lafayette.

Gain or Loss in Dyeing

After knitting a roll of carded peeler yarn on the spring-needle machine and then sending it to a dyehouse to be stained Egyptian, would there be any loss or gain in the weight of the roll, and if so, what percentage?

Stanley (1065).

The loss of shrinkage in the dyeing of carded peeler in Egyptian stain, or in fact any

of the prevailing shades on knit goods that are dyed mostly with a direct color process, will be approximately 3 per cent. If it is necessary to first bleach the goods to obtain the required clearness or brightness of shade the loss in weight will be 2 per cent. more, or a total shrinkage of 5 per cent. Morocco.

Duplicating a Knit Fabric

We are making a light weight bleached ribbed vest and want to know how to set a knitting machine to make a certain webbing. We are enclosing a piece of webbing, No. 2, that we want to make, also a piece, No. 1, of what we are knitting. We like the loose, flat stitch in the webbing desired and would like to know what change to make in our machine to produce the result. Portland (1033).

I have thoroughly examined the two samples of knit fabric, Nos. 1 and 2, and find that as far as the knitting goes they are identical. No. 1 on the top end is a plain 1 by 1 rib; the lower part is made with alternate rows of plain and tuck stitches, 1 by 1 rib.

No. 2 has alternate rows of plain and tuck stitches, 1 by 1 rib.

In No. 1 the wales of the tuck stitch rib lie close together, and in sample No. 2 they are open and apart. It is this effect of the wales of the rib showing up better that I understand your correspondent desires to obtain. It is not

obtained in the knitting of the fabric, but in the finishing of the cloth or garment.

If No. 1 is stretched and held apart it looks exactly like No. 2. To produce the same effect in No. 2 the garment should be boarded so as to stretch it apart; when dry it will remain so.

I am of opinion that No. 2 is not part of a ribbed vest like No. 1, where the machine changes from 1 by 1 rib plain stitch for the waist part to 1 by 1 rib tuck stitch for the body, because the plain part of the knitting has a tendency to draw together the wales of the rib in the tuck part, the plain part being narrower than the tuck part. I examined some ribbed vests recently like No. 1 and found them to look the same. I also examined some corset waist covers that looked the same as No. 2, including the finish of the sewing machine on the bottom.

The ribbed vests had about an inch in length of plain stitch at the bottom, whereas No. 2 has the tuck stitch clear to the bottom. From my investigations I have come to the conclusion that the cloth of sample No. 2 is made all 1 by 1 rib tuck stitch and that the machine does not change from tuck stitch to plain stitch as desired for shaping the ribbed vest as that which produces No. 1 does.

If No. 2 had been the same as No. 1, part plain and part tuck stitch, and still showed the different effects, then I should have had

to arrive at some other explanation for the difference. My conclusion is that the cloth of No. 2 is made all tuck 1 by 1 rib and tubular; that it is bleached in the roll, and in drying is run over a spreader to open up the wales of the rib; and that then the corset waist covers are cut out from the cloth thus dried, which of course remains as shown in sample No. 2.

The only way in which the effect of No. 2 could be produced in the knitting would be to have the feeds which make the tuck stitch courses make a shorter stitch than the plain courses, as the tuck stitch loops are of course larger than the all plain loops. To do this, the stitch cams of the tuck feeds would have to be equipped with a movable cam, the same as is used on this class of machinery for making what is known as a slack course in hosiery for looping purposes.

This of course could easily be done, and operated automatically by the chain which on the machine operates the changes for all plain work to tuck work. At the same time the machine is changing from plain to tuck, the stitch cams of the tuck feeds, which are every alternate feed, would be operated upon to shorten the stitch, and in like manner operated to lengthen the stitch again, when changing to all plain work.

If the tuck stitch is shortened so that the

loops of the tuck stitches would not be any larger than the all plain loops, then the wales of the ribs would have a tendency to be open and apart like No. 2 without decreasing the elasticity of the fabric.

Your correspondent can easily make a test by knitting the fabric in the manner just described, by adjusting the stitch cams of the tuck feeds to make a shorter stitch, and then knit a piece of cloth all tuck, 1 by 1 rib, without changing to all plain 1 by 1 rib. If the effect proves to be just what he wishes to produce, the machine can then be made to do the work automatically. Lafayette.

Percentage of Cotton in Merino Yarn

How can I determine accurately the percentage of cotton or wool in merino yarn?
Rexford (1242).

The percentage of cotton in merino yarn is determined in the following manner: Weigh a fair sized sample of the yarn, then sew it up in a small cheesecloth bag and boil the sample for 15 minutes in a 10 per cent. solution of caustic potash. Rinse the sample well, then squeeze out the surplus water by wringing in a cloth. What is left of the sample after this treatment is cotton, which should be exposed to the open air until dry and then weighed. A comparison of the weight before the treatment

with the weight afterwards will indicate the percentage of cotton in the yarn. Ex. A sample of merino yarn weighs 20 grains before boiling out, and 7 grains afterwards, find the percentage of cotton. $7 \div 20 = 35$ per cent. cotton.

Marking Knit Goods to Stand Bleaching

Can you give us any information in regard to marking knit goods that we have to bleach? We have never found a satisfactory method of marking the cloth before it goes into the kier.

Salem (1052).

"Salem" can overcome this difficulty by using coal tar diluted with carbolic acid to a consistency of thick cream. This will withstand the bleaching process. It is used with stamps and a pad. The pad is made in the following manner: Get a shallow box the size of the stamp required, put in a layer of thick felt at the bottom, spread over this felt a thin layer of diluted coal tar, then cover with a piece of rag or waste knit goods. It is then ready for use. Press the stamp on the top layer of cloth until the tar comes through on the stamp, then use it on your goods. The top cloth is to prevent too much tar from getting on the stamp and blurring the marks. Care should be taken to keep the stamps clean, as the flakes from the goods stick to the stamp and thus make the stamping thick and

blurred. I have blocks made of different shapes and sizes, with oval, triangle or diamond outlines for different purposes and the letter or figures are made on little blocks of wood which are inserted in the larger block. A thumb screw on the side holds them in place. Dulcimer.

. . .

I have read with interest the question and answer regarding the marking of knit goods which appeared in the April issue. You have given a good formula for marking goods so that the marks will stand the bleach. I have always instructed knit goods manufacturers in this locality to use coal tar, as that is the only material that will stand the bleaching process. "Dulcimer" recommends the use of wood blocks for stamping the letters or figures. These blocks are good as far as they go, but I have made the stamps of brass for years. They can be made either solid or with the letters adjustable by a thumb screw. The tar does not have any effect on the metal, which will last three times as long as wood. This is merely my experience. I have been in the business only forty years. A. M. Michael.

Making Knit Goods Unshrinkable

What are the methods for making knit goods unshrinkable? Kingman (2119).

It is after the fulling process that the goods are subjected to the chemical process to render them what is termed unshrinkable. There are several methods used, but perhaps the best known is the chlorine and acid treatment. Chlorine gas, in its commercial state, is embodied in what is technically known as chloride of lime, and to obtain free chlorine the following process is necessary: In a wooden vat free from iron or other minerals in the form of nails, screws, etc., dissolve the chloride of lime in clean cold water, breaking the lumps in order to free the chloride or green gas, as it is termed. Do this carefully and when all the gas is liberated by stirring, etc., let it stand for a sufficient length of time to allow the lime to settle. Then the clear water should have a greenish tint. Skim off any floating substance that may have risen to the top and let it again settle. It is essential to cover up while settling in order to keep out all dirt. One pound of chloride of lime is added to every 10 gallons of water in the vat.

Acid Treatment for White Goods. First treat in a sulphuric acid bath in an ordinary wooden vat with sufficient water to cover the goods. The temperature of the water is raised to about 170° to 175° F. Use 6 1/2 ounces to every 10 pounds wool goods to be treated. Mix the acid well with the water before putting in the goods, and when the goods

are in keep them under the liquor for about 30 minutes, turning occasionally.

Certain yarns of hard spun qualities may be treated as already explained for whites, but in this class of goods color has to be taken into account and it may be necessary to reduce the strength of the sulphuric acid to 5 ounces for every 10 pounds of goods, and also to reduce the temperature to 120° F. For soft woolen goods it is best to use hydrochloric instead of sulphuric acid, treating in the same way as explained. It is impossible to adopt a fixed rule for the strength of the acid, as it must be varied according to qualities, and should in all cases be sufficient to give the desired effect as to shrinkage without affecting the natural color of the fabrics.

Having treated the goods in the acid bath, take them out and pass through squeezing rollers to extract all excessive moisture, taking care to save the liquor. The acid liquor may be used again by adding acid to bring it to the required strength.

Prepare another bath of water at about 80° F. to cover the goods. Add to this the clear liquor from the chlorine vat, taking care not to disturb the lime in any way. The strength of the chlorine may be taken as an average at one pound of chloride of lime for each 10 pounds of goods. One pound of chloride of lime is used to every 10 gallons of water,

which is required for 10 pounds of goods. Keep the goods well under the water for say 15 minutes, with occasional turning. As chlorine in excess will injure the wool fibers, no greater strength than is absolutely necessary to give the result desired should be used, and for fine goods often less will be required, as the liquor permeates the fabric quicker. Soft woolen yarns require the least strength. Soft spun yarns often require only a mild treatment, but coarse, heavy goods require more than the standard strength.

After taking goods from the chlorine bath, wash out carefully in lukewarm water, adding sufficient soap to clear off any lime remaining. Some goods will require more soap than others to give them the soft feel desired.

Treat dyed goods carefully by reducing the strength of the acid and chlorine liquors, and also the temperature of the baths, leaving the goods in the liquor for a longer time. For delicate colors use a cold hydrochloric acid and chlorine bath. The goods can remain in the liquor for some time until the desired result is obtained.

The goods when taken from the bath should be carefully washed to free them from all lime or other foreign substances that may remain, and well rinsed in lukewarm water, then run through squeezing rollers and extracted.

In drying the goods avoid an excess of heat and have good ventilation, because while moisture remains further chemical action may take place. After the goods leave the drier it is essential that they be damped before pressing. The usual way is to use sheets. These are made of soft woven cloth especially adapted for holding moisture. This is cut into pieces, say 4 feet long by 2 feet wide. They are well saturated with water and left a few minutes for the water to become evenly distributed. Then a sheet is laid straight and as many hose laid on as will lie together without overlapping. Another sheet is then laid over same and another lot of goods placed on it. This is repeated till a sufficient quantity is so laid, then they are turned over, taken out and another lot damped. F. W. Herrington.

Knitting Neckties

Do knitted neckties keep their shape? Can an ordinary hosiery or underwear mill make this class of goods without difficulty? How are some styles made? Barker (2114).

Knit ties of pure silk and silk and mercerized cotton are very popular. They are made in a large number of very attractive designs and effects and of any color that one would desire. Another good point in their favor is that they are made so as to slip easily through

the turned down collar. They keep their shape after they are tied up as well as, if not better than, any other silk tie.

Tie knitting is being taken up by many manufacturers who never have had anything to do with knitting machinery of any kind. These ties cannot be made in an ordinary hosiery or underwear mill as ordinarily equipped and it would entail quite an expense to purchase special machinery such as is adapted to the handling of silk, dyeing and winding. Owing to the variety of colors used knitted ties are more profitably made by such manufacturing firms as are using silk yarn all the time.

These ties are knit on latch needle machines of 10, 12 or 14 gauge and with 1 1/2 to 2 1/4 inch cylinders. Although the patterns are complicated and silk yarns are difficult to run, any knitter who has made hosiery or underwear would have very little difficulty in making good at the tie knitting business.

An ordinary plain tie is made with needles so arranged as to have a long latch needle alternate with a short latch needle. The long latch needles hold the stitches for a certain number of revolutions before casting off. This continues for any desired length, after which the machine changes automatically to a plain knitted fabric for the neck band of the tie.

After the plain knitting is made the required length, the machine again changes automatically to make the long end of the tie the length required. It will then change to plain knitting, making a space of three inches to separate the ties. A machine will produce 10 to 12 dozen ties in 10 hours.

Another tie is made by having three short latch needles alternate with one long latch needle, using any two colors desired, such as black and white, old rose and green, garnet and white, etc. The long latch needles will hold the stitch for as many revolutions as required before casting off. When the required length is knit it will make the plain knitted fabric in one color only, and will change again automatically, knitting the two colors until the tie is finished.

A plain stripe tie can be made either with short latch or long latch needles as desired and is made on two feeds. On one feed there are placed, for example, a navy spool and a white spool and on the other feed only a navy spool. When the stripe is working one navy comes out while the white goes in for two revolutions. This shows up on the tie one revolution of white stitches and then one of navy stitches and again one revolution of white, then a space of four stitches, when the stripe is again continued as before and then repeated

once more. Then there is a space of an inch and a half of plain navy before the three stripes start again.

What is known as a wide bias stripe tie is made on two feeds, using all long latch needles and a wheel cut one and one, except at one place where a slot is cut which allows three needles to hold the stitches. This wheel has an even number of cuts in it and the cylinder has an odd number of needles, a plain wheel on one feed and the cut wheel as described on the other feed.

This pattern shows up very well in black and white, dark green and red, navy blue and Alice blue. Laramie.

Bleached Goods Turning Yellow

I am enclosing two samples of knit goods. Both pieces were bleached with chlorine made from an electrolizer. I boil off for five hours in a Jefferson kier, using 2 per cent. bleaching assistant, 1 per cent. caustic, 1/4 per cent. Turkey red oil, rinsing in a kier for one hour. I then take the goods out and wash in a machine for one-half hour in hot water, then in cold water, then run them in the chlorine liquor for one hour at 2° Tw. Rinse in cold water for 20 minutes, sour in 5 per cent. antichlorine for 25 minutes, rinsing thoroughly. Blue and take out, extract and dry in a Hurricane dryer at a temperature of 120° F. After the goods lie around for a few days they turn yellow. I also have the same trouble with my heavyweight goods. Duplan (1276).

The electrolizer chlorine bleach is very popular and very good. "Duplan's" trouble may be in the bleaching. Another hour would do no harm. It is best not to use any Turkey red oil, as the oil retards the action of the caustic on the goods. The bleaching assistant, if it is a good one, should serve the purpose that the oil is used for. It seems to me that the chlorine bath is a little strong at 2° Tw., and would tend to force a white on the goods. It would be much better and cheaper if "Duplan" used the chlorine bath a little weaker and let the goods lie a little longer, instead of forcing them. as one hour is not long enough for the chlorine to do its work. If the goods are thoroughly bottomed in the boil for one hour, or the chlorine bath is too short, use the chlorine at 1° Tw. and leave the goods in longer, as 1° is strong enough unless the goods are very heavy. It seems to me that the antichlorine is not strong enough, otherwise the goods are not long enough in this bath to neutralize the chlorine in the goods. This will produce the trouble "Duplan" is having. The drying at 120° is all right, and the goods should be soft when dried at this temperature. If "Duplan" will try the following process for one batch of goods I am sure his trouble will disappear:

Boil 6 hours with

2% Bleaching Paste,
1% Caustic Soda,
1% Soda Ash.

Leave out the oil. Follow the usual process as to washing the goods, using the chlorine at 1° Tw. and let the goods lie a little longer than before, or until they are a good white. The antichlorine used, whether it be muriatic, acetic or sulphuric acid, should be tested and used about 1/2° Tw. stronger than the chlorine bath, leaving the goods long enough for the acid to neutralize the chlorine in them. Then wash and blue the goods and dry as usual. A lot of trouble in bleaching yarn, knit goods and piece goods is caused by rushing in the process to keep up the production and to keep down the cost, at the same time sacrificing the finish. Alpha.

Stains on Bleached Knit Goods

We are having a great deal of trouble with our bleached goods being stained and streaked. One part of a roll may be all right and another part in the same roll may be brown for several yards or may have yellow blotches all along in it. Some of our cloth run in the same batch will be different shades. We had several batches come out apparently all right, but after getting several weeks old they turned very yellow. Other goods bleached in the same way remained perfect. We are enclosing samples of these. The following are our

bleaching directions: We boil in a covered wooden kier 8 hours. The kier has a vomit pipe in it. We use 1 lb. caustic soda to 100 lbs. goods. Boil 1,000 to 1,200 lbs. at a time. Use 100 lbs. steam pressure. Rinse out in three waters in boiling kier. Run goods in bleach at 2° Tw. until specks are all out, say about 15 or 20 minutes. Run in cold water 15 minutes. Run in sulphuric acid for 15 minutes. Run in cold water, then in hot water and soap. Run in cold water about 10 minutes then to extractor. Beacon (1226).

The trouble "Beacon" is having with the yellow blotches and brown places in his knit goods is apparently due to haste in getting the goods through the process. It is a trouble that happens to most people in the bleaching business. The goods are either not boiled long enough, or are packed unevenly in the kier or jammed tight around the vomit pipe and slack on the outside. Again the washing of the goods in the kier if not done thoroughly prevents the chemic from doing its work, as the bleaching agent is destroyed before acting on the cotton.

The weight of caustic is all right; another quarter of a pound to 100 pounds of goods would do no harm, or better still use half a pound of soda ash with one pound of caustic to every 100 pounds of goods; this will help to get them whiter. The length of time for boiling is all right, but the chemicing is too severe and too quick. It would pay "Beacon"

to adopt the following method for chemicing the goods:

Mix 10 lbs. soda ash with every 100 lbs. of chemic powder in the mixer, or if he does not mix his own, add 5 lbs. of soda ash to each carboy of chemic at 14° Tw. Stir this up and then let it settle, using the clear liquor for the goods in the following manner: After boiling the goods, rinse thoroughly in the kier, lift out of kier into extractor, then into bleach at 1° Tw., letting them lie for one to three hours until the goods are snow white, without danger of tendering them, the soda ash producing the whiteness which the chemic lacks. "Beacon" might try one lot in this manner, checking the time of labor, cost of chemic and most important of all, note the difference in the color of his goods. "Beacon" must see that each roll is thoroughly saturated in the chemic bath. When they are white enough, wash out all the chlorine and sour at 1/2° higher than the chemic bath, letting them lie longer in the acid bath, say from one to two hours, thus giving the acid time to neutralize any trace of chemic that has been left in the goods. Wash the goods thoroughly after taking from the acid bath, then soap as usual and put in extractor. If this method is followed good results will surely be obtained.

Delco.

Shrinkage in Underwear

Can you give us any information on the subject of shrinkage in the manufacture of woolen underwear? Norfolk (1956).

I take it for granted that the information you desire is for flat knit underwear which is cut in the grease and scoured, fulled and boarded in the garment. In the first place the conditions such as stock and the method of handling must be taken into consideration. Each mill must determine the exact shrinkage on every style that is run by actual tests, as for instance an all wool line would require considerable more allowance for shrinkage than a line of 30 per cent. cotton.

Also different grades of wool will take a different shrinkage and styles containing shoddy still another shrinkage. All these must be tested out each time a new style is added to the line, or each time the ingredients in the batches are changed. I have found that it is necessary to knit these goods one inch wider than the actual width required at boxing and they must be cut from 8 to 12 inches longer than length required at boxing, to allow for shrinkage at both looping and fulling. Always keep in mind that the conditions under which the goods are handled will change the shrinkages.

The following is a test shrinkage of an all

wool garment knit on 16 gauge, 21 grain yarn (weighing six ends), 19 inch cylinder cloth measuring 21 inches at the cutting table, cut 40 inches long, sleeve cut 22 inches long. To the body of this garment is looped a 6 inch rib tail and to the sleeve a 6 inch cuff. This garment goes to the scouring from 39 to 40 inches long, 21 inches wide, and finishes at the boxes 34 inches long, 20 inches wide, sleeve 21 inches, cuff and borders 4 inches long. Badger.

Gauges of a Latch Needle Machine

Please give me information on the following points:

1st. The different gauges of a latch needle knitting machine. Example, 8 cut, 24 gauge.

2d. The count of yarn that is best adapted for the different gauges; from the heaviest to the lightest. Example, 7s heaviest—10s lightest on an 8 cut machine.

3d. If you were to pick up a latch needle and look at it, how would you tell what gauge it was and the size of the hook?

4th. The cylinder needle as a rule is larger in the hook than the dial needle of the same machine. If you were running from heavy to light count of yarn on the different cuts or gauges, what hook needle would be preferable on both dial and cylinder? Lester (1952).

The different gauges of a latch needle machine are as follows:

4 cuts, 12 gauge
6 cuts, 18 gauge
8 cuts, 24 gauge
12 cuts, 36 gauge

By cuts is meant the number of needles or slots to an inch or the circumference of a cylinder. As a rule cylinders are not cut much finer than 12 to the inch, because as high as 42 gauge needle can be used in them providing, when ordering a cylinder cut 12 to the inch, it is designated for 42 gauge. The 42 gauge needle being finer the slots or cuts are made to fit this gauge. This also applies to any gauge as it is found if the article to be produced is light in weight, but not fine in the stitch, a cylinder is procured which is cut as before stated. For example, a 4 cut cylinder if cut for it can run with an 18 gauge needle, or a 6 cut can run with a 24 gauge needle, etc.

The cotton counts of yarn best adapted for different gauges are as follows:

2s heaviest—4s lightest or a 4 cut machine.

5s heaviest—7s lightest or a 6 cut machine.

7s heaviest—10s lightest or an 8 cut machine.

12s heaviest—18s lightest or a 12 cut machine.

As a rule a knitter knows by experience what the gauge or needle is because very few knitters have a wire or needle gauge to meas-

ure the gauge by. A 12 gauge needle would be quite thick and if it had a 12 gauge hook on it would be in proportion to the thickness of the needle, but if the 12 gauge needle should have an 18 gauge hook, it could readily be distinguished because of the hook being so much smaller than the rest of the needle.

In running from heavy to light counts of yarn it is always advisable to have the cylinder needle, both hook and needle, one gauge, but the dial needles can be made with a finer hook than the cylinder needle. The reason for this is that if it is desired to change from heavy to light goods, the dial stitch can be made tighter and produce a finer knit fabric than if the dial needle was the same gauge of hook as the cylinder needle. For example, on a 36 gauge cylinder the dial should have a 36 gauge needle with a 42 gauge hook, and the same proportion in the different gauges, which enables one to change from light to heavy yarn without having to change the cylinder or dial needle to do so.

Laramie.

Changing a Mill from Two-Piece to Union Suits

Would it be advisable to change a mill making two-piece garments to union suits and what are the advantages and disadvantages of such a change. Butler (2117).

In the first place the profits on the two lines should be investigated. I doubt if any of the manufacturers of union suits today are making any more money on a dozen pair of shirts and drawers, whereas they should get double, as one suit really represents a shirt and drawers.

In cutting suits the waste is bound to be more as it requires a strip of cloth nearly the length that a shirt and drawers would take, consequently the cutter cannot work to as good advantage in turning out holes, etc. Then again the seconds will double up, for when a second is made in the shirt end of the suit, the drawers end must also go for a second. The same naturally will happen if the drawers end of the suit gets spoiled, whereas in the two-piece garments only the shirt or drawers becomes a second, as the case may be.

In the different operations throughout the mill the seconds will also be greater owing to the bulky character of the double garment, as it is difficult for the operators to keep the goods from catching in the machines or dragging on the floor and getting soiled. The greatest care must be taken to keep the floors and tables clean, and the machines and shafting free from oil.

Madison.

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